

**REMARKS**

**I. INTRODUCTION**

Applicants thank the Examiner for the indication that claims 26, 70, 71, 82 and 83 are allowed, and that claims 4, 21-25, 41-43, 62-69 and 73-81 would be allowed if rewritten in independent form.

Claims 7, 21, 22, 24-26 and 83 have been amended above to remove minor informalities therefrom, and not for any reason relating to patentability thereof. New claims 84 and 85 have been added. Claim 11 has been cancelled, without prejudice. Accordingly, claims 1-4, 7-10, 12-27, 39-43, 62-69 and 72-85 are now under consideration in the above-referenced application. Provided above, please find a claim listing indicating the current amendment to the previously-pending claims on separate sheets so as to comply with the requirements set forth in 37 C.F.R. § 1.121. It is respectfully submitted that no new matter has been added.

**II. OBJECTION TO CLAIM 7 SHOULD BE WITHDRAWN**

Claim 7 stands objected to as depending from now-cancelled claim 6. As the Examiner shall ascertain, claim 7 has been amended above to depend from pending independent claim 1. Accordingly, the objection to claim 7 is now moot, and should therefore be withdrawn.

**III. REJECTIONS UNDER 35 U.S.C. § 103(a) SHOULD BE WITHDRAWN**

Claims 1-3, 7-10, 12-20, 27, 39, 40 and 72 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Zimnyakov et al., “Spatial speckle correlography in applications to issue structure monitoring,” Applied Optics, Vol. 36, No. 22, August 1, 1997, pp. 5594-5607 (the

“Zimnyakov publication”), in view of U.S. Patent No. 6,324,419 issued to Guzelsu et al. (the “Guzelsu Patent”) and U.S. Patent No. 5,735,276 issued to Lemelson (the “Lemelson Patent”). Claim 11 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the Zimnyakov publication, in view of U.S. Patent No. 6,564,089 issued to Izatt et al. (the “Izatt Patent”), U.S. Patent No. 6,198,956 issued to Dunne (the “Dunne Patent”), or U.S. Patent No. 6,141,577 issued to Rolland et al. (the “Roland Patent”).

With respect to the § 103(a) rejection of claim 11, this claim has been cancelled without prejudice. Accordingly, this § 103(a) rejection is now moot, and should therefore be withdrawn. With respect to the § 103(a) rejection of claims 1-3, 7-10, 12-20, 27, 39, 40 and 72 as set forth above, Applicants respectfully request the 35 U.S.C. § 103(a) rejection of these claims be withdrawn for at least the reasons set forth herein below.

In order for a claim to be rejected for obviousness under 35 U.S.C. § 103, not only must the prior art teach or suggest each element of the claim, the prior art must also suggest combining the elements in the manner contemplated by the claim. *See Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 934 (Fed. Cir.), cert. denied 111 S.Ct. 296 (1990); *see In re Bond*, 910 F.2d 831, 834 (Fed. Cir. 1990). "It is improper to use the inventor's disclosure as a road map for selecting and combining prior art disclosures." *See Grain Processing Corp. v. American Maize-Products Corp.*, 840 F.2d 902, 907 (Fed. Cir. 1988). "[T]he reference must be viewed without the benefit of hindsight afforded to the disclosure." *In re Paulsen*, 30 F.3d 1475, 1482 (Fed.Cir. 1994). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicant' s disclosure. *See In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991).

Applicants' invention, as recited in independent claim 1, relates to a method of analyzing tissue, which comprises the steps of, *inter alia*:

illuminating a tissue with coherent or partially coherent light;

receiving light reflected from the tissue at a detector and forming series of speckle patterns; and

**analyzing changes in the speckle patterns at time intervals sufficient to measure changes caused by microscopic motion of objects within the tissue, wherein the tissue is at least one of in vivo or an internal tissue.**

Applicants' invention, as recited in independent claim 39, relates to a method of analyzing a tissue structure, which comprises the steps of, *inter alia*:

illuminating the tissue structure with coherent or partially coherent light;

receiving light reflected from the tissue structure at a detector and forming a series of speckle patterns;

gathering speckle pattern data at time intervals sufficient to measure microscopic motion within the tissue structure or adjacent tissue; and

**assessing the tissue structure by analyzing spatial characteristics of the speckle pattern data to deduce structural or biomechanical characteristics of the tissue structure, wherein the tissue structure is at least one of in vivo or an internal tissue structure.**

In the Office Action dated January 6, 2006, the Examiner states that the Zimnyakov publication only disclosed that the techniques described therein "was carried out in vitro." (See Office Action dated January 6, 2006, p. 2, ln. 26). Thus, the Examiner effectively admitted that the Zimnyakov publication fails to teach, suggest or disclose **analyzing changes in the speckle patterns at time intervals sufficient to measure changes caused by microscopic motion of objects within the tissue (which is in vivo and/or an internal tissue)**, as recited in independent claim 1, or **assessing the tissue structure by analyzing spatial characteristics of the speckle pattern data to deduce structural or biomechanical characteristics of the tissue structure (which is in vivo and/or an internal tissue)**, as recited in independent claim 39.

However, the Examiner contends that the Guzelsu Patent performs an analysis *in-vivo*, and that the Lemelson Patent describes the testing of skin and internal tissues. (See *id.*, p. 2, ln. 26 to p. 3, ln. 1). Then, the Examiner stated that “[i]t would have been obvious to one skilled in the art to have carried out the method of Zimnyakov et al *in-vivo* as is a well known expedient in the art of optical tissue diagnosis and to either monitor the skin or internal tissue as taught by Lemelson.” *Id.*, p. 3, lns. 1-4. Applicants respectfully disagree.

Applicants respectfully assert that there is no teach, suggestion, motivation or incentive to combine the Zimnyakov publication with the Guzelsu and Lemelson Patents in a manner contemplated by the Examiner. The Examiner is respectfully reminded that “[m]ultiple cited prior art references must suggest the desirability of being combined and the reference must be viewed without the benefit of hindsight afforded to the disclosure.” (emphasis added) *In re Paulsen*, 30 F.3d 1475, 1482 (Fed. Cir. 1994), emphasis added. “The problem confronted by the inventor must be considered in determining whether it would have been obvious to combine the references in order to solve the problem. *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 679 (Fed. Cir. 1998). Applicants respectfully submit that *there is no motivation or incentive to* make the combination of the references as indicated by the Examiner to allegedly teach or suggest Applicants’ invention as recited in independent claims 1 and 39.

In particular, one of the objects of the present invention is “to characterize tissue by analyzing speckle patterns formed by light reflected from tissue.” (Applicants’ Specification, e.g., p. 1, lns.6-7). However, one of the objects of the Guzelsu Patent is “to provide an apparatus which produces a very small gage length or spot size of the light beam to enable measurement of soft tissue deformations *in-vivo*.” (Guzelsu Patent, col. 4, lns. 7-10). Certain objects of the Lemelson Patent

are “to provide a new and improved system and method for scanning and detecting or identifying select matter of a portion of matter containing such select matter and other matter, in mixture, as cellular tissue or otherwise combined ... [,] and detecting and indicating the presence of a select chemical and/or biological material, in a sample of matter or in tissue or body fluid of a living being.” (Lemelson Patent, col. 4, lns. 25-34). Thus, the problem confronted by the inventor for the above-identified application is completely different than the problem confronted by the inventors in the Guzelsu and Lemelson Patents. Indeed, the Lemelson Patent has absolutely no mention of the use of speckle patterns associated with tissue structures. In addition, neither the Guzelsu Patent nor the Lemelson Patent even remotely mention any reason or benefit to **analyze changes in the speckle patterns at time intervals sufficient to measure changes caused by microscopic motion of objects within the internal or in-vivo tissue, as recited in independent claim 1, or assess the tissue structure by analyzing spatial characteristics of the speckle pattern data to deduce structural or biomechanical characteristics of the internal or in-vivo tissue structure, as recited in independent claim 39.** Merely because the Guzelsu Patent refers to the in-vivo analysis, and the Lemelson Patent mentions the selection and identification of matter in internal tissues, such indications do not provide any motivation or incentive to combine these references to the Zimnyakov publication to teach or suggest Applicants’ invention as recited in independent claims 1 and 39.

Applicants further submit that “[i]t is improper to use the inventor’s disclosure as a road map for selecting and combining prior art disclosures.” *See Grain Processing Corp. v. American Maize-Products Corp.*, 840 F.2d 902, 907 (Fed. Cir. 1988). “[T]he reference must be viewed without the benefit of hindsight afforded to the disclosure.” *In re Paulsen, supra*. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must be found in the prior art and not be based on Applicants’ disclosure. *See In re Vaeck*, 947 F.2d

488 (Fed. Cir. 1991). Applicants respectfully submit that the Examiner is relying on an **improper hindsight reconstruction**, which cannot be used for rejecting the claims of the above-identified application.

Therefore, Applicants respectfully asserts that there is no teaching, suggestion, motivation or incentive to combine the Zimnyakov publication with the Guzelsu Patent or the Lemelson Patent in a manner contemplated by the Examiner to teach or suggest the subject matter recited in independent claims 1 and 39. Thus, the §103(a) rejections of these claims and the claims which depend there from should be withdrawn.

In addition, it is believed that various claims which depend from amended independent claims 1 and 39 are also allowable for at least the same reasons, as well as containing separately patentable subject matter.

For example, claims 12 recites that **a detector is located farther than one wavelength of light from the tissue and detects far field speckle**, and claim 13 recites that **the detector is located within one wavelength of light from the tissue and detects near field speckle**. None of the Zimnyakov publication, the Guzelsu Patent or the Lemelson Patent teaches or suggests any such recited subject matter. In the Office Action of January 6, 2006, with respect to claim 13, the Examiner contends that the specific placement of the detector with respect to the tissue is merely a design choice. Applicants respectfully disagree, and point the Examiner to the recitations of these claims which specifically state that this placement of the detector allows the detector to detect far field speckle (claim 12) or near field speckle (claim 13), and the placement thereof is important for such detection, i.e., not merely a design choice. Accordingly, the subject matter recited in these claims is patentable over the references relied on by the Examiner for rejecting such claims.

With respect to claim 14, this claim recites an implementation of **an analyzing step which comprises comparing each of the series of speckle patterns to a series of reference speckle patterns, and quantifying the temporal correlation differences between the speckle patterns and the reference patterns.** Indeed, the Examiner is not pointing to any of the references relied thereby to reject these claims as including such subject matter. Accordingly, it is submitted that this subject matter is not contained in such references. Claims 15-17 which depend from claim 14 also include additional subject matter which is not taught or suggested by the references relied on by the Examiner, nor does the Examiner contends that they do.

Further, with respect to claim 18, this claim recites that the analyzing step **further comprises analyzing spatial characteristics of the speckle pattern to deduce structural characteristics of the tissue.** Again, the Examiner is not pointing to any of the references relied thereby to reject these claims as including such subject matter. Accordingly, it is submitted that this subject matter is not contained in such references.

#### **IV. NEW CLAIMS 84 AND 85**

New claims 84 and 85 have been added above to depend from independent claim 39, and to recite similar subject matter as that recited in claims 4 and 62, respectively, which the Examiner indicated as being allowable. Support for these new claims can be found in the specification, drawings and originally-filed claims of the application. Applicants respectfully assert that claims 84 and 85 are allowable over the references relied on by the Examiner in the Office Action dated January 6, 2006 for at least the same reasons as provided in this Office Action with respect to claims 4 and 62. A conformation of allowability of these claims is respectfully requested.

V. **CONCLUSION**

In light of the foregoing, Applicants respectfully submit that pending claims 1-4, 7-10, 12-27, 39-43, 62-69 and 72-85 are in condition for allowance. Prompt consideration, reconsideration and allowance of the present application are therefore earnestly solicited.

Respectfully submitted,

Dated: April 6, 2006



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